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August 24, 2004
RC-04-0133

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTN: K. R. Cotton

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
LICENSE AMENDMENT REQUEST - LAR 04-0440
EMERGENCY FEEDWATER SYSTEM PUMP TESTING CRITERIA

Pursuant to 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority, hereby requests an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications (TS).

The proposed change will revise Surveillance Requirements 4.7.1.2.a.1 and 4.7.1.2.a.2 to reflect a more representative model of the Emergency Feedwater System. The new model has established new TS acceptance criteria to assure the design requirements of the system are met. These required characteristics are more stringent than those currently in the VCSNS TS for this system. Administrative Letter 98-10 has been determined to be applicable for this condition and the revised acceptance criteria has been incorporated into the surveillance test procedures as an administrative control. This change will also result in revising the Bases for 3/4.7.1.2.

Information contained herein provides the No Significant Hazards Determination. Attachment I provides the TS page marked up with the proposed change. Attachment II provides the retyped TS pages.

The VCSNS Plant Safety Review Committee and the Nuclear Safety Review Committee have reviewed and approved the proposed change. SCE&G has notified the State of South Carolina in accordance with 10CFR50.91(b).

SCE&G requests approval of the proposed amendment within one year of submittal in accordance with the NRC goal for review of license amendment requests. Once approved, the amendment shall be implemented within 30 days.

There are no other TS changes in process that will affect or be affected by this change request. There are no significant changes to any FSAR or FPER sections.

If you have any questions or require additional information, please contact Mr. Ronald B. Clary at (803)-345-4757.

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I certify under penalty of perjury that the foregoing is true and correct.

8/24/04
Executed on


Stephen A. Byrne

PAR/SAB/dr

Enclosures:

Evaluation of the proposed change

Attachment(s): 3

1. Proposed Technical Specification Change - Mark-up
2. Proposed Technical Specification Change - Retyped
3. List of Regulatory Commitments

c: N. O. Lorick
N. S. Carns
T. G. Eppink (w/o Attachments)
R. J. White
W. D. Travers
NRC Resident Inspector
P. Ledbetter
K. M. Sutton
T. P. O'Kelley
RTS (LAR 04-0440)
File (813.20)
DMS (RC-04-0133)

**Subject: LICENSE AMENDMENT REQUEST - LAR 04-0440
SURVEILLANCE REQUIREMENT 4.7.1.2 AND ASSOCIATED BASES**

1.0 DESCRIPTION

South Carolina Electric & Gas Company (SCE&G) requests an amendment to revise the Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications (TS) Surveillance Requirements (SR). The proposed change to SR 4.7.1.2.a.1 and 4.7.1.2.a.2 and the Bases for 3/4.4.7.1.2, are being requested to more accurately reflect the changes in the mathematical model (Design calculation DC-05220-076) of the Emergency Feedwater System (EFW). The new model is more representative of the plant and has been used to establish more stringent performance criteria for the system pumps. The proposed change will:

- a) Update SR 4.7.1.2.a.1 to revise the Surveillance Requirement from demonstrating that each motor driven EFW pump will develop a discharge pressure of greater than or equal to 1600 psig at greater than or equal to 90 gpm flow to demonstrating that each motor driven EFW pump will develop a total developed head of greater than or equal to 3800 feet at greater than or equal to 90 gpm flow.
- b) Update SR 4.7.1.2.a.2 to revise the Surveillance Requirement from demonstrating that the turbine driven EFW pump will develop a discharge pressure of greater than or equal to 1330 psig at greater than or equal to 97 gpm flow to demonstrating that the turbine driven EFW pump will develop a total developed head of greater than or equal to 3140 feet at greater than or equal to 97 gpm flow.
- c) Revise Bases 3/4.7.1.2 to clarify design requirements for the EFW system and address the margin that the new Surveillance Requirement criteria establish.

2.0 PROPOSED CHANGE

Specifically the proposed changes would revise the following:

2.1 TS 4.7.1.2.a.1

SR 4.7.1.2.a.1 is being revised to provide more conservative performance criteria for the motor driven EFW pumps. The criteria is being changed from greater than or equal to 1600 psig at greater than or equal to 90 gpm flow to a total developed head of greater than or equal to 3800 feet at greater than or equal to 90 gpm flow.

2.2 TS 4.7.1.2.a.1

SR 4.7.1.2.a.2 is being revised to provide more conservative performance criteria for the turbine driven EFW pump. The criteria is being changed from greater than or equal to 1330 psig at greater than or equal to 97 gpm flow to a total developed head of greater than or equal to 3140 feet at greater than or equal to 97 gpm flow.

2.3 Bases 3/4.7.1.2

The Bases are being updated to provide additional clarification with respect to the design requirements for the EFW system as well as discuss the new performance criteria including a defined value to account for flow control valve leakage.

3.0 BACKGROUND

The VCSNS TS have always used a discharge pressure and flow rate to establish the acceptance criteria for surveillance testing of both the motor driven and the turbine driven Emergency Feedwater pumps. The mathematical model of the EFW system has recently been refined and benchmarked against plant operational data. This activity has led to a more representative model of the EFW system, which is being used to establish the pump characteristics that are required in order for the design requirements of the EFW system to be met. When reviewed against current TS acceptance criteria, the new values are more conservative for both the motor driven and the turbine driven EFW pumps.

Nuclear Regulatory Commission Administrative Letter (AL) 98-10 states that if a non-conservatism is discovered in the facility Technical Specifications, the Licensee may take administrative control of the issue to prevent a violation of the safety limits, while processing a TS change to resolve the issue. The condition requires corrective action, of which the administrative controls (more conservative acceptance criteria in the testing procedure) are an immediate corrective action to be followed up with a TS change to provide final action. The use of AL 98-10 benefits both the NRC and the Licensees, as this process can minimize the number of emergency and exigent TS changes that would have to be processed, while maintaining compliance with 10 CFR 50 Appendix B, Criterion 16, Corrective Actions.

Additionally, the proposed requirements are in terms of total developed head by which the effects of varying suction tank levels (suction pressures) are eliminated. The current acceptance criteria, in terms of PSIG, are dependant on the level of the Condensate Storage Tank, with greater margin available when the tank is full. Since the tank is also used during normal operations, the tank level is not assured to be near the maximum level for surveillance testing or during an event.

4.0 TECHNICAL ANALYSIS

The Emergency Feedwater (EF) System provides the required feedwater flow to the Steam Generators for cooldown when the Main Feedwater System is not available. The EF System operates in conjunction with the Main Steam Dump System, if available, or the main steam power relief valves and safety valves, to remove thermal energy from the Steam Generators. The EF System is designed to automatically deliver Emergency Feedwater, at a minimum total flow to at least two Steam Generators pressurized to 1211 psig, within one minute after an

incident which results in insufficient or termination of main feedwater flow. The EF System is also designed to automatically deliver Emergency Feedwater during an ATWS event. Sufficient redundancy exists to establish this minimum flow while sustaining a single active failure in the system in the short term or a single active or passive failure in the long term. The EF System operates until the Residual Heat Removal (RHR) System can be placed into operation.

The pump requirements ensure that the EFW pumps can meet their design requirements. The design requirements for both the motor driven EFW pumps and the turbine driven EFW pump are identical. The design requirements are as follows:

1. Each EFW pump must individually be able to supply 380 gpm to 2 of the 3 steam generators, with the third isolated, while the 2 intact steam generators are at 1211 psig.
2. Each EFW pump must individually be able to supply 400 gpm to all 3 steam generators while the steam generators are at 1211 psig.

It is noted that the proposed pump requirements, inherently include a 5.0 gpm leakage allowance to the isolated steam generator; this allows for the tolerance of some small amount of leakage through the EFW system flow control valves to the isolated steam generator and represents margin when measured flow control valve leak rates are less than 5.0 gpm.

The benchmarked mathematical model of the EFW system was used to determine the system requirements (head in feet and flow in gpm) to meet the design requirements identified above. The isolated steam generator was assumed to be at low pressure (blown down), and a resistance factor was determined and included to model the 5.0 gpm leak to the isolated steam generator. Recirculation flow was left in the open position. The system requirement for each possible combination of flows to two steam generators was evaluated for each pump to ensure that the two most restrictive paths were being utilized in the development of the system head curves. Once the system requirements were determined, a combination of plant start-up and factory data for each of the pumps' performance was used to develop representative pump performance curve shapes.

Once these shapes were determined, fits were developed to mathematically represent the pumps' characteristics and then the pumps' performances were conservatively degraded in a manner such that head degradation increased with increasing flowrate (i.e., the degradation appears, mathematically, somewhat as a speed decrease). The pumps were degraded to a point such the respective system curve and the pump curve intersected at the required flow and head.

Once this level of degradation was found, the fits were used to determine the head requirement for 90 gpm for the motor driven pumps and 97 gpm for the turbine driven pump. (It should be noted that for the motor driven EFW pumps, a speed penalty was applied to allow for voltage and frequency effects due to the allowed voltage and frequency limits for Emergency Diesel Generator operation.) Due to plant start-up data being slightly different for the 2 motor driven pumps, (and very minor differences in system requirements), individual motor driven pump

requirements were calculated. However, for simplicity, the most limiting of the 2 motor driven EFW pump requirements were utilized for both motor driven pumps.

In order to ensure that the 400 gpm to all three steam generators at 1211 psig could be met by each individual pump, the flow model was used to determine the system requirements to provide 400 gpm to all three steam generators with recirculation flow for each respective pump. This total system flow rate was checked against the degraded pump's fits. Then the head produced by the pump was checked to ensure that the heads that could be produced exceeded the respective system requirements.

The proposed acceptance criteria are more restrictive than the current acceptance criteria in the TS, which will provide additional assurance the EFW system will continue to meet the design requirements.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

South Carolina Electric & Gas Company (SCE&G) has evaluated the proposed changes to the VCSNS TS described above against the significant Hazards Criteria of 10CFR50.92 and has determined that the changes do not involve any significant hazard. The following is provided in support of this conclusion.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

This change represents a more restrictive surveillance requirement than currently exists for TS Surveillance 4.7.1.2.a.1 and 4.7.1.2.a.2. These proposed surveillance acceptance criteria changes will ensure that the motor driven EFW pumps and the turbine driven EFW pump can continue to perform their design function. There are no changes planned to any plant installed hardware or software and normal plant operations will not be impacted.

The probability or consequences of accidents previously evaluated in the VCSNS FSAR are unaffected by this proposed change because there is no change to any equipment response or accident mitigation scenario. There are no additional challenges to fission product barrier integrity. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change involves the revision of the Surveillance Requirements for the EFW system. The revised requirements are more restrictive to insure compliance with the design basis of the system. Changes to the system model require changes to the SR acceptance criteria in order to maintain the performance level assumed in the safety analysis.

No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed change. The proposed change does not challenge the performance or integrity of any safety-related system. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does this change involve a significant reduction in margin of safety?

Response: No.

The proposed change will have no affect on the availability, operability, or performance of the safety-related systems and components. A change to the SR is proposed, however, the proposed change is more restrictive than the current SR. The more restrictive criteria inherently include a 5 gpm leak tolerance for the EFW flow control valves. This represents a built in margin for the pump head requirement when the flow control valve leakage is determined to be less than 5 gpm. Therefore, the proposed change does not involve a significant reduction in margin of safety.

Pursuant to 10 CFR 50.91, the preceding analyses provide a determination that the proposed Technical Specifications change poses no significant hazard as delineated by 10 CFR 50.92.

5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical Specifications," requires that a TS limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria:

- (A) *Criterion 1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.*

- (B) Criterion 2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.**
- (C) Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.**
- (D) Criterion 4. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.**

10 CFR 50.36(c)(3), "Surveillance Requirements," stipulates that surveillances be performed to assure the necessary quality of systems and components be maintained, the facility operation will be within safety limits, and that the limiting condition for operation will be met.

The EFW system at VCSNS satisfies both Criteria 2, 3, and 4 and as such is required to have a limiting condition for operation in the facility TS. The proposed change to TS SR 4.7.1.2 requires the acceptance criteria for these surveillances to be more restrictive than currently in TS. The regulatory requirements in 10CFR50.36 continue to be satisfied by this proposed change.

10 CFR 50 Appendix A, Criterion 34, "Residual Heat Removal," requires that a system to remove residual heat be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

10 CFR 50 Appendix A, Criterion 44, "Cooling Water," requires a system to transfer heat from structures, systems, and components important to safety, to an ultimate heat sink shall be provided. The system safety function shall be to transfer the combined heat load from these structures, systems, and components under normal operating and accident conditions.

10 CFR 50 Appendix A, Criterion 54, "Piping Systems Penetrating Containment," requires piping systems penetrating primary reactor containment shall be provided with leak detection, isolation, and containment capabilities having redundancy, reliability, and performance capabilities which reflect the importance to safety of isolating these piping systems.

10 CFR 50 Appendix A, Criterion 57, "Closed System Isolation Valves" requires that each line that penetrates primary reactor containment and is neither part of

the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation.

The proposed change does not violate any requirement or recommended method for assuring and maintaining the plant design and licensing basis. The EFW system will continue to provide a heat sink to the core during normal plant shutdown or accidents where other methods of cooling the core are not available.

IE Bulletin 85-01, "Steam Binding of Auxiliary Feedwater Pumps," provides information pertaining to steam binding of the pumps due to leakage past check valves and requests action by the Licensees to preclude this event from occurring undetected.

The proposed change does not impact the ability of the system to perform its design function, as there are no plant hardware changes. The EFW system will continue to perform to the same high reliability and availability standards.

Generic Letter (GL) 80-88, "Seismic Qualification of Auxiliary Feedwater Pumps," identifies NRC concerns related to the seismic design capabilities of AFW systems in operating PWRs. The design of auxiliary feedwater (AFW) systems should satisfy the same standards applied to other safety related systems in the plant. Only plants Licensed after the Three Mile Island (TMI) accident were reviewed against these requirements in Standard Review Plan 10.4.9

VCSNS was licensed after the accident at TMI occurred, and as such, our submittal was reviewed against the Standard Review Plan section for Auxiliary Feedwater system qualifications. The proposed changes only involve a conservative change to performance criteria.

GL 81-14, "Emergency Procedures and Training for Station Blackout Events," recommended that immediate measures be taken to ensure that station blackout events can be accommodated while Generic Safety Issue (GSI) task A-44 is being conducted. The NRC staff requests that licensees review current plant operations to determine the capability to mitigate a station blackout event and promptly implement, as necessary, emergency procedures and a training program for station blackout events.

The proposed changes to the acceptance criteria for the EFW pump surveillance testing has no impact on the response of the plant structures, systems, or components to coping with a loss of station power. All training and procedures required to identify, respond to, or resolve a Station Blackout event are independent of the testing used to assure operability of the EFW system.

GL 88-03, "Resolution of Generic Safety Issue 93, Steam Binding of Auxiliary Feedwater Pumps," provides the NRC's resolution of the GSI and request that Licensees continue to implement, as a minimum, the monitoring and corrective procedures previously identified for interim resolution of this issue in IE Bulletin 85-01.

VCSNS performed administrative activities to assure compliance with the GL at the time GL 88-03 was issued. The proposed change does not impact the earlier activities or commitments that were required to comply with GL 88-03.

GL 89-18, "Resolution of Unresolved Safety Issue A-17, Systems Interactions in Nuclear Power Plants," provided the NRC's resolution to the issue and provided information to give licensees additional appreciation of the kinds of adverse systems interaction which have appeared in operating experience which can aid them in continuing evaluation of operating experience.

The proposed change does not introduce any new or different kinds of systems interactions since there are no plant or operational changes. The revised surveillance requirements provide assurance that the EFW system will perform as designed and evaluated.

5.2.2 Design Bases (FSAR)

FSAR Section 10.4.9, EMERGENCY FEEDWATER SYSTEM

The VCSNS FSAR is unaffected by this proposed change.

5.2.3 Approved Methodologies

The proposed change is due to the mathematical model for the EFW system (Calculation DC05220-076). The mathematical model of the EFW system has recently been refined and benchmarked against plant operational data. The methodology is similar to previous models utilized at VCSNS and is consistent with activities performed in the industry.

5.2.4 Analysis

The requested changes to TS 4.7.1.2 are required to comply with the requirements of 10CFR50.36(c)(3), Surveillance Requirements, to assure that operation of the plant will be within safety limits. The current acceptance criteria are developed from a model no longer being utilized on site and are not as conservative as the proposed acceptance criteria.

The EFW pumps are currently being administratively controlled such that they are being tested to the proposed surveillance test acceptance criteria. The performance of the pumps remains satisfactory to assure the design basis function is maintained.

5.2.5 Conclusion

The proposed changes to the surveillance requirements of 4.7.1.2 conservatively revise the acceptance criteria to assure the pumps performance satisfies the design requirements of the recently revised mathematical model of the system. Due to the more restrictive nature of these changes, administrative controls have been established to test the EFW pumps to the new acceptance criteria prior to the approval of this change.

6.0 ENVIRONMENTAL CONSIDERATION

SCE&G has determined that the proposed amendment would change requirements with respect to the installation or use of a facility component located within the restricted area, as defined in 10 CFR 20 (Reference 3), or would change an inspection or surveillance requirement. SCE&G has evaluated the proposed change and has determined that the change does not involve, (i) a significant hazards consideration, (ii) a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. As discussed above, the proposed changes do not involve a significant hazards consideration. Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51 (Reference 4), specifically 10 CFR 51.22(c)(9). Therefore, pursuant 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

Attachment to License Amendment No. XXX
To Facility Operating License No. NPF-12
Docket No. 50-395

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

Insert Pages

3/4 7-4
B 3/4 7-2

3/4 7-4
B 3/4 7-2

SCE&G – EXPLANATION OF CHANGES

<u>Page</u>	<u>Affected Section</u>	<u>Bar #</u>	<u>Description of Change</u>	<u>Reason for Change</u>
3/4 7-4	4.7.1.2.a.1	1	Change "discharge pressure" to "total head" Change 1600 psig to 3800 feet	Total head does not depend on the suction conditions for the pump, to assure consistent surveillance results. Revised acceptance criteria based on the results of the revised system model.
3/4 7-4	4.7.1.2.a.2	2	Change "discharge pressure" to "total head" Change 1330 psig to 3140 feet	Total head does not depend on the suction conditions for the pump, to assure consistent surveillance results. Revised acceptance criteria based on the results of the revised system model.
B3/4 7-2	B3/4.7.1.2	1	Added additional design basis information and provided discussion of new acceptance criteria	Identified need to add additional design basis information and provide margin information.

PLANT SYSTEMS

EMERGENCY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3 7.1.2 At least three independent steam generator emergency feedwater pumps and flow paths shall be OPERABLE with:

- a. Two motor-driven emergency feedwater pumps, each capable of being powered from separate emergency busses, and
- b. One steam turbine driven emergency feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With one emergency feedwater pump inoperable, restore the required emergency feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With two emergency feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.
- c. With three emergency feedwater pumps inoperable, immediately initiate corrective action to restore at least one emergency feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each emergency feedwater pump shall be demonstrated OPERABLE:

a. At least once per 31 days by:

- 1. Verifying that each motor driven pump develops a ^{total head} discharge pressure of greater than or equal to ~~1600~~ psig at greater than or equal to 90 gpm flow. _{3800 feet}
- 2. ^{total head} Verifying that the steam turbine driven pump develops a ^{3140 feet} discharge pressure of greater than or equal to ~~1330~~ psig at a flow of greater than or equal to 97 gpm when the secondary steam supply pressure is greater than 865 psig. The provisions of Specification 4.0.4 are not applicable. f
- 3. Verifying that each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

PLANT SYSTEMS

BASES

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM

The OPERABILITY of the emergency feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of off-site power.

Each emergency feedwater pump is capable of delivering a total feedwater flow of 380 gpm at a pressure of 1211 psig to the entrance of two out of three steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F at which point the Residual Heat Removal System may be placed into operation.

Insert →

3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 11 hours with steam discharge to the atmosphere concurrent with total loss of offsite power. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose also includes the effects of a coincident 1.0 GPM primary to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the accident analyses.

Insert for Bases Section B3/4.7.1.2

Also, each Emergency Feedwater (EFW) pump is capable of supplying 400 gpm to all 3 steam generators while the steam generators are pressurized to 1211 psig. This capacity is sufficient to ensure that the pressurizer does not overfill during a loss of normal feedwater event. The total head criteria of 3800 feet for the motor driven EFW pumps and 3140 feet for the turbine EFW pump includes margin that allows for a maximum EFW flow control valve leakage of 5 gpm for any one of the 6 EFW flow control valves.

ATTACHMENT II

PROPOSED TECHNICAL SPECIFICATION CHANGES (RETYPED)

PLANT SYSTEMS

EMERGENCY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three independent steam generator emergency feedwater pumps and flow paths shall be OPERABLE with:

- a. Two motor-driven emergency feedwater pumps, each capable of being powered from separate emergency busses, and
- b. One steam turbine driven emergency feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With one emergency feedwater pump inoperable, restore the required emergency feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With two emergency feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.
- c. With three emergency feedwater pumps inoperable, immediately initiate corrective action to restore at least one emergency feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each emergency feedwater pump shall be demonstrated OPERABLE:

- a. At least once per 31 days by:
 1. Verifying that each motor driven pump develops a total head of greater than or equal to 3800 feet at greater than or equal to 90 gpm flow.
 2. Verifying that the steam turbine driven pump develops a total head of greater than or equal to 3140 feet at a flow of greater than or equal to 97 gpm when the secondary steam supply pressure is greater than 865 psig. The provisions of Specification 4.0.4 are not applicable.
 3. Verifying that each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

PLANT SYSTEMS

BASES

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM

The OPERABILITY of the emergency feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of off-site power.

Each emergency feedwater pump is capable of delivering a total feedwater flow of 380 gpm at a pressure of 1211 psig to the entrance of two out of three steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F at which point the Residual Heat Removal System may be placed into operation.

Also, each Emergency Feedwater (EFW) pump is capable of supplying 400 gpm to all 3 steam generators while the steam generators are pressurized to 1211 psig. This capacity is sufficient to ensure that the pressurizer does not overflow during a loss of normal feedwater event. The total head criteria of 3800 feet for the motor driven EFW pumps and 3140 feet for the turbine driven EFW pump includes margin that allows for a maximum EFW flow control valve leakage of 5 gpm for any one of 6 EFW flow control valves.

3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 11 hours with steam discharge to the atmosphere concurrent with total loss of offsite power. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose also includes the effects of a coincident 1.0 GPM primary to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the accident analyses.

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**ATTACHMENT III
LIST OF REGULATORY COMMITMENTS**

There are no regulatory commitments created due to this License Amendment Request.